

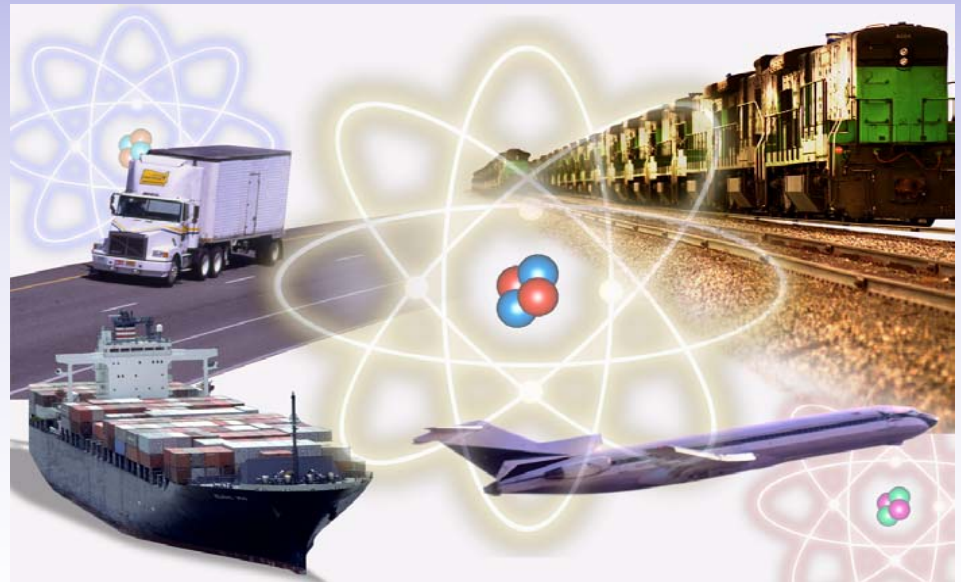
# Radioactive Material Transportation

## Utah Issues



# Modes of Transport

- Air
  - Used for short lived radiopharmaceuticals
- Rail
  - Used when materials are very heavy or bulky.
- Truck
  - Used for everything else
- Water
  - *Not in Utah*



# Who Regulates Radioactive Material Transportation?

- Nuclear Regulatory Commission



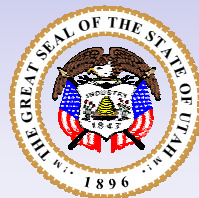
- Regulates users of radioactive material (in conjunction with Agreement States) and the design, construction, use and maintenance of shipping packages for more hazardous radioactive material shipments

- U.S. Department of Transportation



- Regulates shippers and carriers of radioactive material and the conditions of transport (such as routing, tie-downs, vehicle requirements, handling and storage)

- State of Utah



- Highway Patrol and Department of Transportation enforce federal highway and motor carrier rules.
- Division of Radiation Control inspects shipments of waste at Envirocare.

## **Shipments subject to advance notification**

- Spent fuel shipments
- Highway Route Controlled Quantity (HRCQ) shipments
- Transuranic shipments to WIPP

# Types of Carriers

State of Utah

Department of Environmental Quality

Division of Radiation Control

## Common



Common and contract carriers provide a service to others. They carry other peoples' materials. Common carriers have published rates for hauling material. Common and contract carriers are not licensed by the NRC. The responsibility for safety rests with the shipper, who must meet the requirements of DOT and NRC. (e.g. Federal Express and UPS are common carriers)

## Contract



Contract carriers negotiate a specific contract with the shipper. The contract may require extra-regulatory requirements. (e.g. TriStates is a contract carrier.)

## Private



Private carriers own the radioactive material which they carry. The transport of material is accomplished in direct support of the radioactive material user's business. These carriers are licensed by the NRC or an Agreement State. Examples of private carriers who transport their sources from one job site to another are:

- Industrial Radiographers
- Portable Gauge Users
- Well Loggers

# Types of Shipments




- Radioactive Materials
  - Medical and Research sources
  - Consumer Products
  - Industrial Sources
  - Uranium Ores/Alternate Feed Materials
- Radioactive Waste
  - Spent Reactor Fuel
  - Transuranic Waste
  - Low Level Waste
  - Uranium Mill Tailings

# Who Ships Radioactive Materials?

- Radioactive Material (RAM) Licensees
  - Radiopharmaceuticals
  - Portable and Fixed Gauges
  - Industrial Radiographers
- Nuclear Power, DOE sites, RAM licensees, Other
  - Low Level Waste
  - NORM/NARM
  - Mixed Waste
  - Uranium Mill Tailings/Alternate Feed Materials
- DOE Waste Isolation Pilot Plant
  - Transuranic waste
- Foreign Research Reactor Spent Fuel
- DOE Office of Civilian Radioactive Waste
  - Commercial Spent Fuel

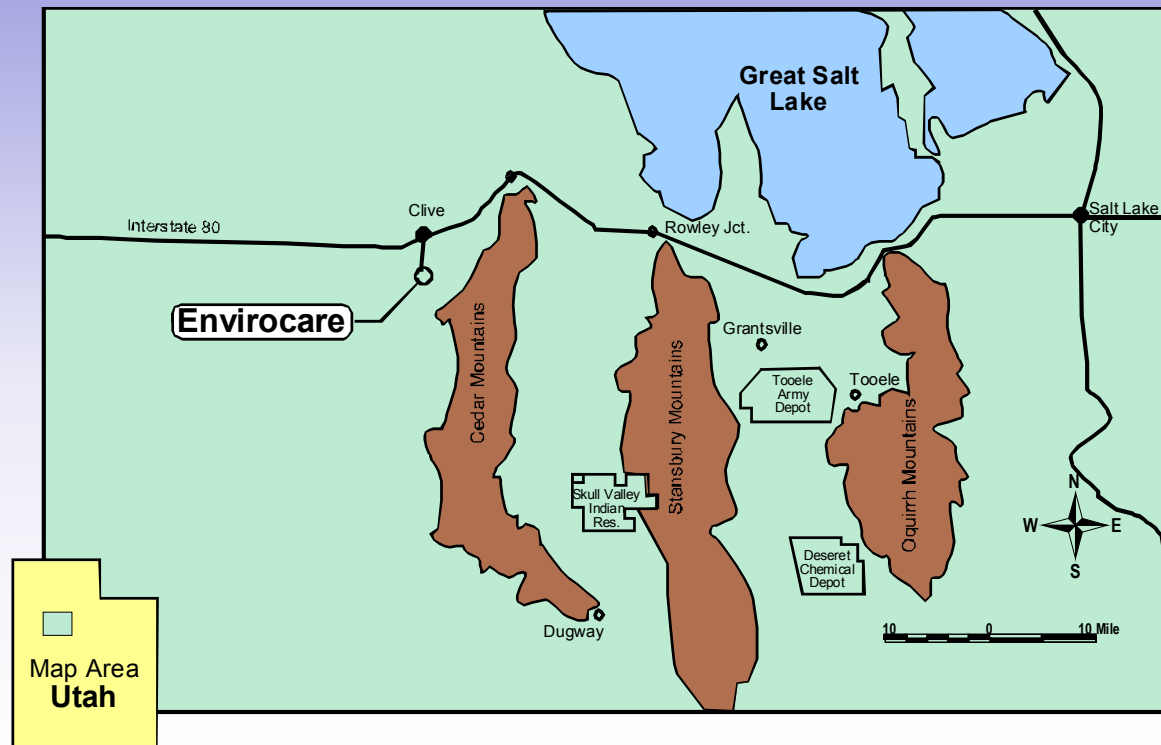
# Radioactive Material Shipments

Shipments made to or from Utah Licensees

- 187 Licensees
- 2 Radiopharmacies
  - Incoming shipments 2340/yr or  45 /wk
  - Outgoing to hospitals 15,600/yr or  300 /wk
- 4 Universities
  - 2300 shipments/yr or  45/wk
- 10 Radiographers
- 77 Portable Gauge Users
- 94 Other licensees

# Radioactive Waste Shipments to Envirocare

- Shipments Began 1988
- Shipment Activity
  - 11,115/yr or 213 rail cars/wk
  - 1873/yr or 36 trucks/wk



# Waste Isolation Pilot Project

Transuranic Shipments from USDOE sites

- WIPP facility near Carlsbad, NM
- Shipments began March 1999
- 35 year duration
- 578 thru Utah to date
- 14-20 shipments/wk
- Currently all by truck
- Northern Interstate System
- Training ongoing since 1988
- 3 Emergency Response Exercises  
(Morgan 93, South Weber 95, Tremonton 99)



# **Enhanced Safety Measures for WIPP Shipments**

- **Carrier Requirements**
  - Strict maintenance for tractors and trailers
  - Governed to a speed of 65 miles per hour
  - Clean up contractor on standby
  - Each truck has two drivers
  - Drivers carry cellular and satellite phones
  - Monitored by TRANSCOM
  - Must stop for frequent load inspections

# **Enhanced Safety Measures for WIPP Shipments**

- **Driver Qualifications**
  - At least 21 years of age
  - 325,000 miles experience in the last 5 years
  - No violations in the last 5 years
  - 2 years experience in the last five years
  - Commercial Vehicle Safety Alliance vehicle inspector
  - Complete Radiological Response Course
  - Annual physical and random drug screens

# Foreign Research Reactor Spent Fuel

## Spent Fuel from Overseas

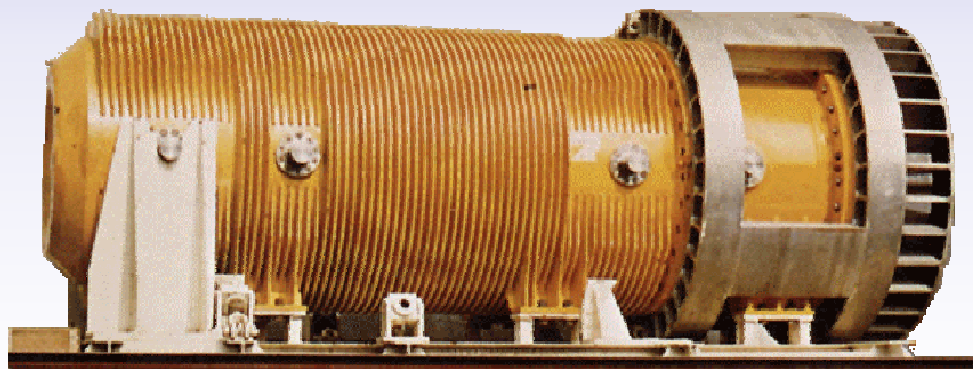
- Shipments began July 1998
- 13 year duration
- 1 train from California (3 casks)
- 3 shipments by truck from South Carolina (9 Casks)
- Training for Utah emergency responders in 1997
- Emergency Response Exercise in Cache County 1997



# Spent Fuel Shipments

## Office of Civilian Radioactive Waste Management

- Shipments to Yucca Mountain
- 30 year duration
- 175 shipments/year or 3-4 per week
- All shipments by interstate highways and rail lines
- Training required by National Waste Policy Act of 1987
- Regional Group (WGA) involvement likely



# Transportation Safety Based on Packaging Design and Function

- Contain Material
- Control Radiation Levels
- Prevent Criticality
- Dissipate Excess Heat

# Types: Excepted Packaging

Materials with extremely low levels of radioactivity



# Industrial Packaging

Used for Low Specific Activity Shipments (LSA)  
or Surface Contaminated Objects (SCO)



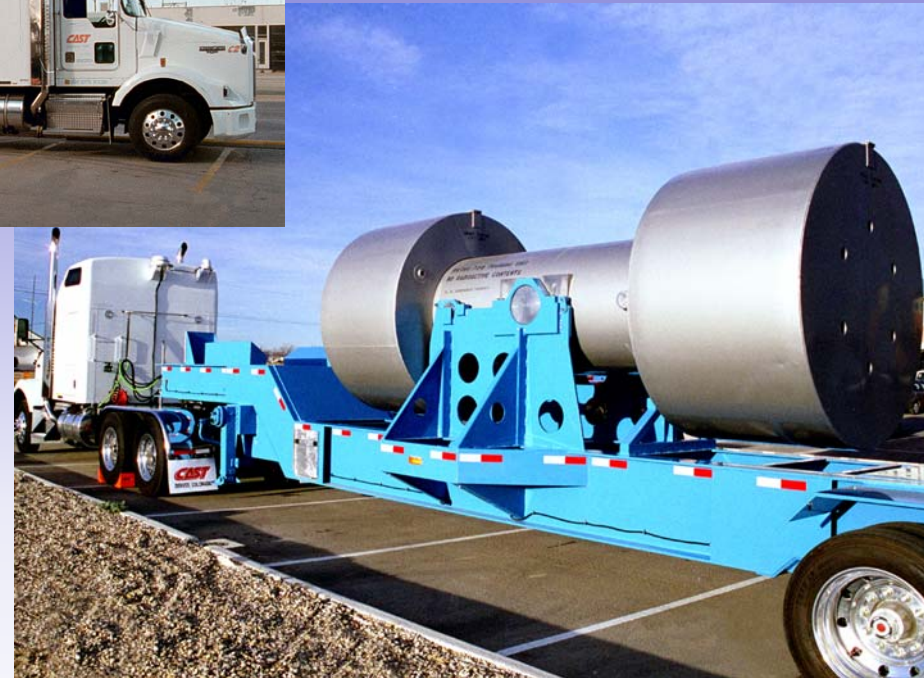
# Type A Packaging

Designed to withstand normal transport  
and minor mishap conditions

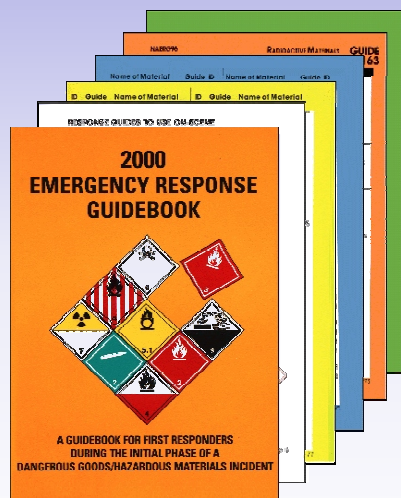
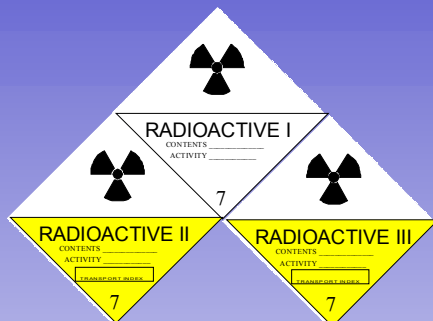


# Type B Packaging

Designed to withstand normal transport  
and severe accident conditions



# Transport Information Available to Emergency Responders



The Manifestation

It is recommended that a manifest be completed and a copy be provided to the appropriate authority for the purpose of tracking the material.

Page 1 of 1

DATE: 10/10/2000

TIME: 10:00

LOCATION: 1000

NAME: 1000

PHONE: 1000

ADDRESS: 1000

CITY: 1000

STATE: 1000

ZIP: 1000

PLACARDS TENDERED YES (NO)

COO: 1000

DATE: 10/10/2000

SIGNATURE: 1000

1000

2912

# Emergency Response

- Local Responders First on scene
- Coordination begins here
- Responsibilities
  - Rescue Injured
  - Extinguish Fires
  - Provide First Aid/CPR
  - Isolate Area
  - Make Notifications to those with assets
    - Shipper
    - UHP, DEQ, DES, Federal Agencies



# **Emergency Response Assets**

- **Local**
  - Emergency Services (Fire, Police, Medical)
  - Licensee, Shipper, Cleanup Contractors
- **State**
  - Division of Emergency Services
  - Utah Highway Patrol HAZMAT
  - Division of Radiation Control
- **Federal**
  - Department of Energy
  - Federal Emergency Management Agency
  - Environmental Protection Agency
  - Nuclear Regulatory Commission

# Emergency Response

- **HAZMAT team may help control incident**
  - Prevent spread of Contamination
  - Limit Exposure
  - Evaluate package integrity
  - Survey/decontaminate responders or victims



# Emergency Response

- **Role of the Division of Radiation Control**
  - Resource to on-scene responders to:
  - Define the problem
  - Recommend Cleanup strategies
  - Evaluate package integrity
  - Survey/decontaminate responders or victims
  - Regulate Cleanup and Material Disposition



# Agencies That Offer Radiation Emergency Training



**Federal Emergency Management Agency (FEMA)**



**Department of Energy (DOE)**



**Department of Transportation (DOT)**



**Environmental Protection Agency (EPA)**



**Nuclear Regulatory Commission (NRC)**

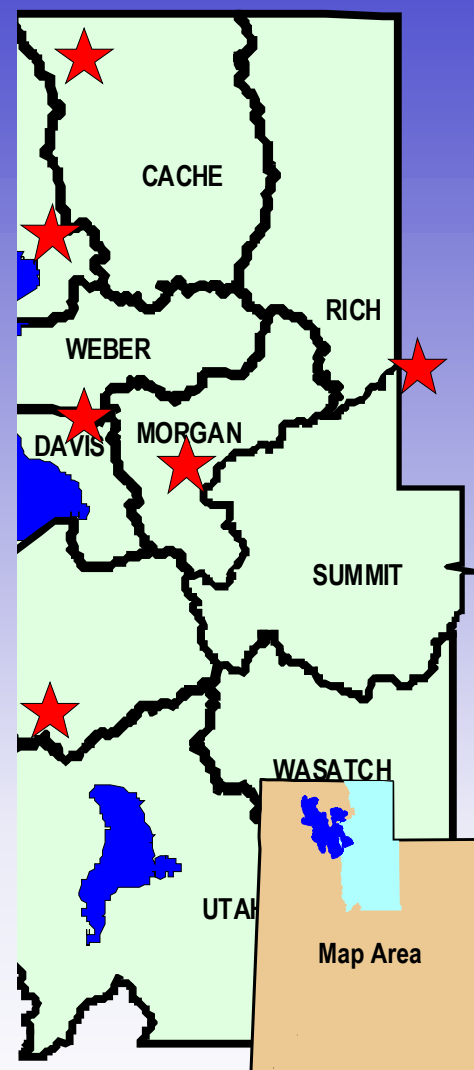


**Department of Defense (DOD)**

- **Division of Radiation Control (UDEQ)**
- **State Fire and Police Academy**
- **City and County Emergency Organizations**

# Utah Radiological Emergency Exercises

- **Morgan County 1993**
  - WIPP exercise
- **South Weber 1995**
  - WIPP exercise
- **Evanston, Wyoming 1996**
  - WIPP exercise
- **Cache County 1997**
  - FRR Rail exercise
- **Tremonton 1998**
  - WIPP accident
- **Salt Lake City 2001**
  - 2002 Olympics “Dirty Bomb” exercise



# **Utah Radiological Emergency Training**

## **Coordinated by DRC Since 1988**

- 1200 responders trained by DOE & DRC
- 12 Hospital courses at 6 sites
- 10 responders sent to Train the Trainer Courses
- 2 Highway Patrol to Inspection Training

# **Potential Actions by the Utah Radiation Control Board**

- Brief Utah Local Emergency Planning Committees regarding training opportunities and DEQ/DRC capabilities
- Continue training and exercises (as available)
- Clarify on-site emergency responsibility through rulemaking for commercial radioactive waste disposal facilities (R313-25-3)
- Other recommendations by Board members